

USDA/APHIS/VS

Anticipating the future



VS Scenarios set in 2009

USDA/APHIS/VS
United States Department of Agriculture
Animal and Plant Health Inspection Service
Veterinary Services



*"The future will always be unpredictable,
but with the right techniques it can be imagined and managed."*

—Fahey and Randall, *Learning from the Future*

This booklet presents four scenarios of interest to animal health in the year 2009: *Retail Rulemakers*; *Green Authority*; *Patchwork Quilt*; and *Biotech Alliance*.

Scenarios are stories of plausible futures; they are crafted to help an organization see how possible futures might look and how these futures might come about. As decision makers compare and contrast different futures, their implicit assumptions about industry, technologies and the economy are inevitably raised and challenged.

Veterinary Services (VS) first adopted scenario planning in 1998. Under the VS Futures Project, the Center for Emerging Issues and APHIS Program and Policy Development developed four scenarios to assist VS planning and decision making in the next decade: *Green Eggs and Ham*; *Industrial Strength*; *Ask Not What Your Government Can Do for You*; and *America is Job #1*. Those scenarios focused on organic agriculture, animal industry consolidation, smaller government and protectionism.

New societal and business developments, and the opportunity to gain broader VS participation in scenario planning, prompted VS to update the scenarios. Beginning fall 2000, a team of VS scenario developers re-opened the questions of

what trends will almost certainly influence animal health in 2009, and what major uncertainties remain. The development team included VS managers and employees from headquarters, regions, areas, labs, and technical centers. Center for Emerging Issues provided direction and research support, and Policy and Program Development guided the group process. Five VS Management Team members

served as advisors. By spring 2001, the developers were hypothesizing about the future in a structured and creative way, using relevant uncertainties to generate scenario plots.

Retail Rulemakers, *Green Authority*, *Patchwork Quilt*, and *Biotech Alliance* emerged as plausible, interesting, and relevant scenarios that challenge VS in fundamental ways. Global

retailers' impact, advances in biotechnology, environmental restrictions on agriculture, and evolving state-federal relations are among the issues that will increasingly demand our attention and understanding.

In formulating decisions on trade policy, disease control, capital investment, work force planning, or stakeholder relations, scenarios and the resulting strategic dialogue enable leaders to rehearse and assess how plans and decisions would play out in different circumstances. The actual future that emerges will then contain fewer surprises.

*Anticipating the
future calls for
more than
systematic
analysis. It also
demands
creativity, insight
and intuition.*

Retail Rulemakers



Key Uncertainties



Two fundamental uncertainties set the stage for Retail Rulemakers:

1. Will the animal welfare movement become mainstream and lead to widespread U.S. public perception of most animals as friends and companions? Or will a more utilitarian view of animals predominate?
2. Will trading regimes for animals and their products be characterized by global markets, relatively free movement and increased trade? Or, will protectionism restrict trade to national/local markets?

In this scenario, a global food retailer describes the evolution of retailer power. It is the year 2009, and centralized purchasing by multinational fast food and supermarket chains has created unprecedented retailer and restaurateur leverage over animal production, food safety policy and U.S. exports and imports of food and meat. Powerful global retailers have pushed agribusiness to respond to consumer demands for more humane animal treatment and quality of life.

The strength of our membership is the ability to deftly align global operations with consumer and societal desires. Nowhere has this strength been so apparent as in our response to the intensifying call in affluent markets for animal welfare. This newsletter highlights how our multinational food retailers have led agribusiness in responding to this challenge, resulting in animal production and trade guidelines that create a “win-win” for consumers and retailers.

In our business, most people understand the heritage of a close human-animal bond, though few of us predicted the profound shift in public opinion towards emphasizing the human-like characteristics of animals. Let’s review events from the past decade, and consider how our industry responded.

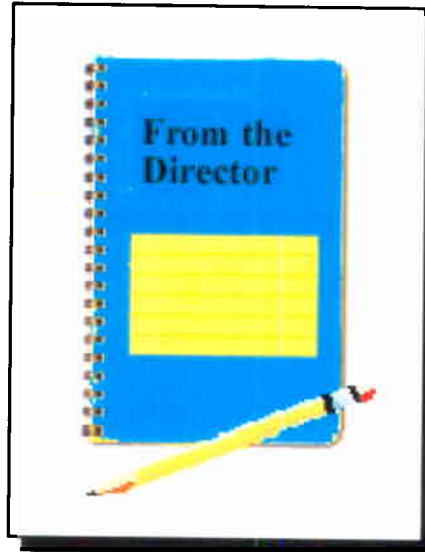
Think first of what’s transpired in the United States. Early in the decade, the United States had become urbanized, older, affluent and animal-loving. Average family size had continued its incremental decline and baby boomer-empty nesters spent millions of dollars annually caring for their companion animals. As those boomers and their children contemplated food animals and wildlife, a unique and mutually beneficial synergy grew between animal welfare moderates and animal rights proponents.

On the trade scene, George W. Bush chose veteran free trader Robert Zoellick as his chief trade negotiator. Mr. Zoellick aggressively facilitated trade agreements, first with Latin America and then with Europe. Given that U.S. and European multinationals controlled most world trade in animals and their products, corporate input into our trade policies with Europe was substantial.

The European Union, as we know, was struggling to reconcile its social conscience with the advances of globalization. European activism forced public debate on a host of issues affecting animal rights, the environment, labor and the role of agriculture. The mere fact that the Swiss held a 2001 national referendum on guaranteeing animal rights when a human owner died or divorced spoke volumes. Farm animals across the continent, moreover, certainly benefited from the movement, launched in the United Kingdom and followed elsewhere, for humane animal treatment. The Europeans simply refused to compromise animal quality of life.

Although laboratory research in Europe and the United States had initially attracted most attention from the animal liberation movements, animal production became the most important target in the long run because it affects many more animals than do laboratory experiments. Remember the United Kingdom academics who decried that production in Britain killed 700 million animals a year for food in year 2001, while only 2.5 million a year were used in research and testing.

McDonalds, that powerful exporter of fast food and values, paved the way toward bridging the gap between critics and proponents of food animal production. By 2004, McDonalds Corporation animal treatment guidelines had spread through other major restaurant companies and retail stores and expanded to include on-farm, feedlot and on-ranch guidelines for beef and dairy cattle, hogs and poultry. In the wake of that McDonalds “multiplier effect,” we have created what some have called the Decade of the Global Retailer. The moniker is well deserved, for it was the retailers and restauranteurs such as McDonalds -- with their



close connections to developed world consumers -- who saw the writing on the wall and assertively responded. Retailers had essentially become the profit-generating voice of the American public; through their retail purchases, Americans expressed their demand on a host of issues including greater liability of meat producers who sell tainted product and further restrictions on genetic engineering in food animal and fish production.

Animal protection had taken over the mainstream and one thing was clear: the United States and other affluent societies were primed to accept stronger animal welfare provisions in national and international commerce. In a highly mobile and fast-paced society, animal companionship and protection had become stabilizing forces for the human psyche.

McDonalds, Wal Mart and a handful of powerful multinationals from both continents helped to negotiate the landmark Animal Quality of Life Treaty signed in 2005 by the EU, NAFTA countries, Australia, New Zealand, Japan and Singapore. The treaty stepped up protections and quality of life measures for food, recreational and companion animals; first world consumer demands for "no animal testing" and "humanely raised" products were recognized in the extensive certification protocols. To secure inclusion of Australia and New Zealand, negotiators conceded stricter standards and controls on traded products containing genetically modified organisms. As for Japan and Singapore, a growing love for companion animals -- and a growing respect for the sanctity of farm animals and the food they produce -- had been building for years.

Developing countries, as you know, reacted quite differently to the treaty. Malaysian farmers described it as an attempt to force them to pay for the happiness of first world chickens. With more mouths to feed and health problems to consider, poorer countries have in most cases retained their utilitarian perspective on the animal kingdom. New scientific and technologic applications, including many that exploit animals, are viewed as necessary for economic development.

Here in the United States, we've seen interesting consequences including reductions in animal production within our borders and a slight decrease in consumption of meat and animal products. Citizens and legislators in most regions are staunchly advocating that all animals, even production animals, require dignity and a nurturing environment. Global retailers have asserted that animal quality of life is quite consistent with a profit motive, and that an entrepreneurial spirit can successfully blend these goals.

We've moved admirably in that direction. Today, centralized purchasing decisions of our large restaurant and retail chains -- and our demand for standardized products -- translate into unprecedented leverage over all phases of meat production and the nation's food supply. Global retail and fast food industries have truly shaped American and European social and cultural landscapes: from ranching and farming to diets and health, from marketing and labor practices to even larger economic trends.

Enjoy this issue of the Global Retail Manager!

Green Authority



Key Uncertainties



Two fundamental uncertainties set the stage for Green Authority:

1. In the U.S., will public sector authority be centralized and flow principally from a strong federal government?
Or, will authority be decentralized so that state and local governments are the primary drivers of public policy?
2. Will environmental values and related human health concerns become predominant social values in the USA?
Or, will economic values including prices, food supply and property rights predominate in the public mindset?

In this first decade of the new millenium, public outcry and voter support for agricultural restrictions have intensified in response to a growing and maturing environmental consciousness in the United States. Americans perceive that risks to the environment, including those caused by industrial agriculture, have escalated. Forceful, uniform federal regulations on land rights, water rights, odor control, wildlife, and agricultural site approval and operations are increasingly evident by 2009. Testifying before a blue ribbon Presidential panel, a representative of the Concerned Consumers for Responsible Agriculture urges the panel to support consolidation of three Federal agencies into a new Department of Food and Environmental Safety.

Madame Chairperson:

I wish to thank you and the distinguished members of this panel for allowing me to appear before you today. I've watched patiently for the last three days as representatives of livestock and agriculture interest groups have risen in opposition to the initiative to merge segments of the EPA, USDA, and Interior. They claim that a unified federal regulatory agency would put the final nail in American agriculture's coffin.

But I'm here today to tell you that the powerful groups you've heard so far do not speak for all. In fact, they represent a tiny minority. On behalf of the millions of members of Concerned Consumers for Responsible Agriculture, and, indeed, on behalf of millions of environmentally aware Americans, I urge you to support the initiative to create a new Department of Food and Environmental Safety. Moreover, I remind you of the circumstances that brought us here. This is your chance, ladies and gentlemen. Make 2009 the culmination of our progress in reclaiming our environment and well being.

Ten years ago, it would have been impossible for me to have imagined appearing before a panel like this one. Like most Americans, I was content eating my inexpensive chicken, pork, and beef. I never thought about where those products came from or about how they were affecting me, my family, and the world around us. It didn't take much, though, to waken me from my happy ignorance. All I had to do was watch the news. I saw what happened 7 years ago in North Carolina, when that holding pool ruptured — 42 million gallons of waste killed 18 million fish. I saw what happened to wildlife habitats across the country as land use demands grew. I see what happens every summer when pfiesteria

revives, caused in part by run off from agricultural waste: fish kills in the hundreds of millions since 2002 and more than 600 people hospitalized. Moreover, I've seen how corporate self-regulation has, in numerous industries, failed to fulfill its promises. Countless people like me have come together in the last decade and devoted time, money, and votes to saving our environment and our health. It's not hard to understand why public outcry and voter support for agricultural restrictions grew as

environmental risks escalated. Protests, letter writing campaigns, and boycotts of products from industrial meat operations became commonplace. People have realized that clean water and air are more important than McNuggets. And let's face it, ostrich really does taste a lot like beef.



We used to think, back at the turn of the century, that state and local veterinary authorities, with the help of Washington, could successfully safeguard our health and environment. But we realized, as health and environmental dangers became more frequent, that without a more powerful voice in Washington, industrial producers would continue to find ways to avoid the short arm of the state. Forceful, uniform federal regulations on land rights, water rights, odor control, wildlife, and agricultural site approval and operations grew slowly, but steadily. The Safe Farm Act of 2007, which, as you know, requires all hog and poultry production facilities to treat animal waste to render it inert, is our greatest and most recent victory. Successful federal initiatives like this one benefit everyone from environmentally concerned Americans, to producers themselves. Gone are the days when large, industrial production facilities could simply move from state to state, seeking the path of least regulation. Gone likewise are the days when producers had

to navigate through a labyrinth of varying state rules. In recent years, Washington has proven its ability to mediate competing interests to do what's best for the American people. Our land is cleaner, our wildlife is safer, and our food is healthier.

The results of federal regulations have been immense. In the last eight years, agriculture has scrambled to meet the public's demands for safe food and a safe ecosystem. Certainly, saving public land, limiting construction of animal facilities, requiring site approval, geological and physical testing, and requirements for the use and storage of waste represent tangible efforts to preserve public health. With increased regulation, agriculture has been forced to accept its multifunctional role in society, to coin a term from the Europeans. Industry contributions to the environment, the landscape, the conservation movement, the biotechnology and energy industries, and the rural community have grown tenfold in the last decade.

I admit that the regulations imposed by federal authorities are expensive. Indeed, the costs of operating a livestock production facility have skyrocketed in the last eight years. And rightly so. Those of us who still want chicken, pork, and beef are willing to pay extra at the market for those foods to be produced in an ecologically-friendly way. Those who reject industrial products on principle are willing to pay more for non-industrial, organic meats. In short, consumers have demonstrated that they're willing to pay for their health and safety. Consequently, responsible food manufacturers are still thriving.

Producers also are quick to point out that the high costs of environmental regulation have led to tremendous market concentration in the livestock industry — even greater concentration than existed in the closing decades of the last century. Only the huge, vertically integrated producers,

they say, could afford to stay competitive. Once again, I'll concede the point. However, let us not forget that, before the environmental and public health movement began in earnest, corporate agriculture was well on its way toward mergers, acquisitions and vertical integration. Instead of mourning the continuation of a century-old trend, we should focus on problems we can remedy.

For example, as you are aware, those livestock giants that didn't feel obliged to comply with new regulations have simply gone overseas. I don't need to tell you what disastrous effects could result as the disturbing trend of American producers fleeing regulation continues to grow. I don't want a hog farm in my neighborhood, but why should other countries, less equipped to deal with the problem, have to tolerate them? We need a centralized authority, that is, the proposed Department of Food and Environmental Safety, to tackle this kind of sticky issue forthrightly, just as we needed agencies to address issues of land use and waste management a few years ago.

I realize that I'm short on time and I'm eager to take your questions. Please bear in mind how the American people have demanded that the Government of the United States take a leading role in our nation's agriculture. Heightened public health concerns, the growing voice and influence of environmentally conscious groups, the environmental disasters of the last decade, the human health threats, and the unwillingness of agriculture to voluntarily police itself have forced government to protect the people. But your work, ladies and gentlemen, is not done. We must continue to put the American public first. We must continue to insist that a strong federal government safeguard the American people and the American landscape. When we have moved forward with this proposal, this year will, indeed, be remembered as a turning point.

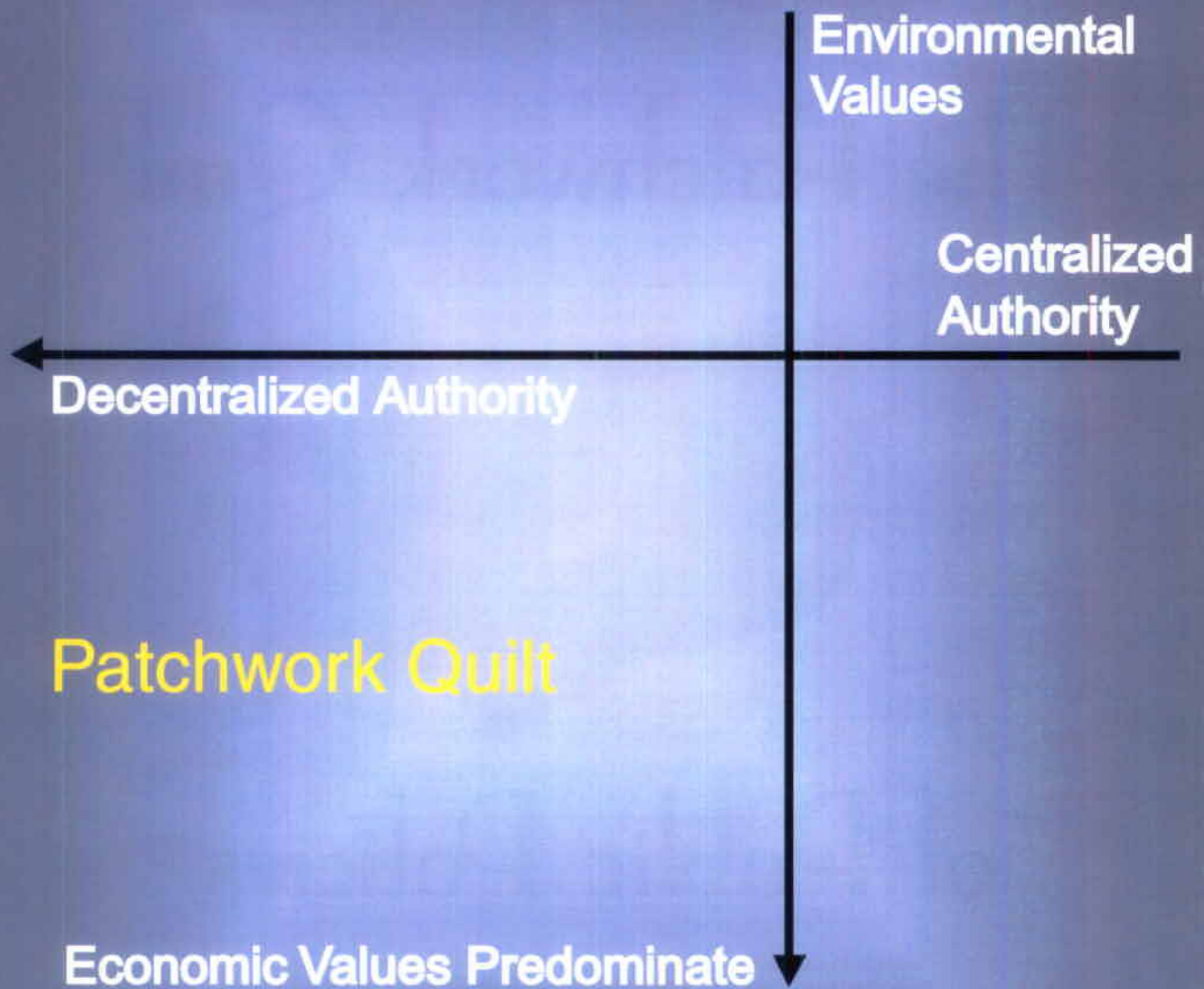
Thank you for listening.

The Patchwork Quilt



of Public Policies

Key Uncertainties



Two fundamental uncertainties set the stage for Patchwork Quilt:

1. In the U.S., will public sector authority be centralized and flow principally from a strong federal government?
Or, will authority be decentralized so that state and local governments are the primary drivers of public policy?
2. Will environmental values and related human health concerns become predominant social values in the USA?
Or, will economic values including prices, food supply and property rights predominate in the public mindset?

Ten years into the 21st Century, a patchwork quilt of public policies affecting animal agriculture has developed in the United States. Citizens, states, and counties care most about the economic values that directly influence their daily lives: food and gas prices, home and property values, urban sprawl and school districts. Looking back, it now seems quite logical that a diverse landscape of local authorities and economic values would ultimately trump the environmental and social causes that seemed paramount at the turn of the century. In this policy patchwork, any federal attempt to preempt state legislation faces a stiff uphill challenge. Part one of this series describes how this policy quilt came to be. Part two, to appear in next week's issue, analyzes what this speckled policy arena implies for the future of animal production, health, and trade.

The Patchwork Quilt of Public Policies

Kansas City Star, January 2009

There is a political philosophy, as old as the U.S. Constitution, that colors much of conservative American thought. It centers on the role of the federal government, especially in the areas of public lands management, property rights and administration of public services. Specifically, this political philosophy calls for limiting government; it furthermore emphasizes states' rights over federal rights. Today, historians describe it as a distinctly American ideology -- one advanced by the legacy of free-ranging trappers, miners, loggers and ranchers in frontier communities of the late 1800s.

Two long-competing romances, the romance of local control and the romance of wise, centralized expertise, have moved in a back and forth continuum

since that time. Sometimes it's been a fight and advocates of local control have sprung up in every state of the union. In modern times, the debate has taken the form of litigation and political maneuvering to invoke or deny federal preemption of state law. The interstate commerce clause of the U.S. Constitution was purposefully vague on this one and court cases have mounted in numerous policy arenas: tobacco advertising, gun control, managed care, and consumer safety, to name a few.

The federal government's role in animal health and production experienced a big taste of this when agencies sought to prevent the spread of brucellosis from Yellowstone bison to nearby cattle. A year of mediation between Montana and federal agencies eventually helped to

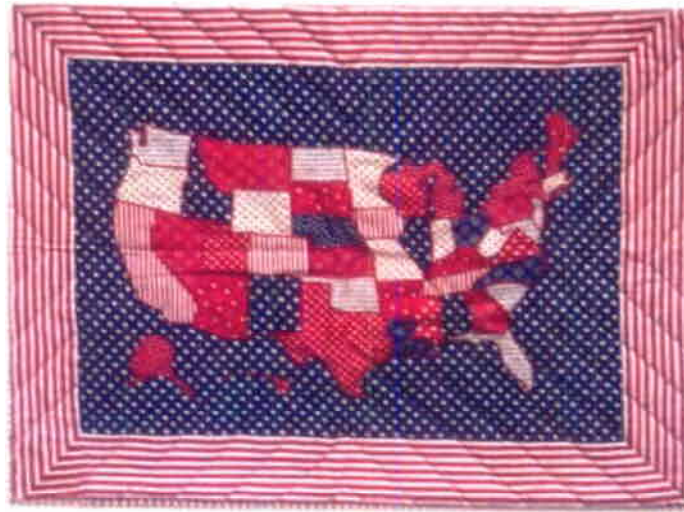
achieve a wildlife, lands and disease management agreement that had been negotiated for nearly eight years. The difficult road to this agreement was a harbinger of states' growing desire to direct animal health initiatives within their own territory.

Moreover, parties at the table for the Yellowstone negotiations included livestock owners, environmentalists, tribal officials, National Park Service, Animal and Plant Health

Inspection Service, Forest Service, State of Montana and others. It had been difficult enough to craft a unified federal position; incorporating the views of these other parties and then considering 67,000 public comments on elements of the draft plan, colored

one's answer to the question, "Who's in charge here?"

When the issue is food prices, or the price of gas at the pump, consumers may not be in charge but they wield influence. As energy prices remained high following spikes in 2000 and 2001, consumers demanded relief. Least acceptable was the 9.1 cents per gallon federal gas tax that big oil often publicized at service station pumps in most states. Consumer groups joined in to help slash the tax by one cent annually for the five-year period beginning 2004. Similarly, in the food sector, consumers and manufacturers rejected heavy handed environmental regulation; consumers in most regions weighed benefits and costs and higher food prices were just not acceptable. There



The Patchwork Quilt of Public Policies

Kansas City Star, January 2009

were exceptions. Localities and states that had experienced food safety outbreaks, such as the rash of salmonella cases in Ohio three years ago, enacted local environmental policies as needed.

“We need to return power back to states, back to local communities,” was a quote attributed to Interior Secretary Gale Norton before she took office in the early days of the Bush administration. Indeed, when George W. Bush was governor of Texas, he had championed the strongest state property rights legislation in the country. Municipal, county and state governments were wrestling with complex urban and suburban sprawl and more states pursued the Texas model with goals to foster efficient development, economic prosperity, property rights and regional planning. Some communities included goals for preserving open space; many did not. As states rights proponents explained their goals to a receptive administration, the desire to exercise federal preemption waned considerably across the policy arena.

Throughout its 2005/2006 session, the U.S. Supreme Court reinforced this trend by further protecting states from suits seeking state compliance with federal laws. Preemption of state tobacco control with weaker federal laws was the first to go. Gone next was the ability of drug company lawyers to argue that the manufacturer of a harm-inducing drug could not be held liable if the manufacturer and the drug complied with less stringent federal regulations. Next, in *State of Nevada vs. United States Environmental Protection Agency* and *United States Geological Survey*, the Court ruled to drastically curtail federal influence over water quality standards.

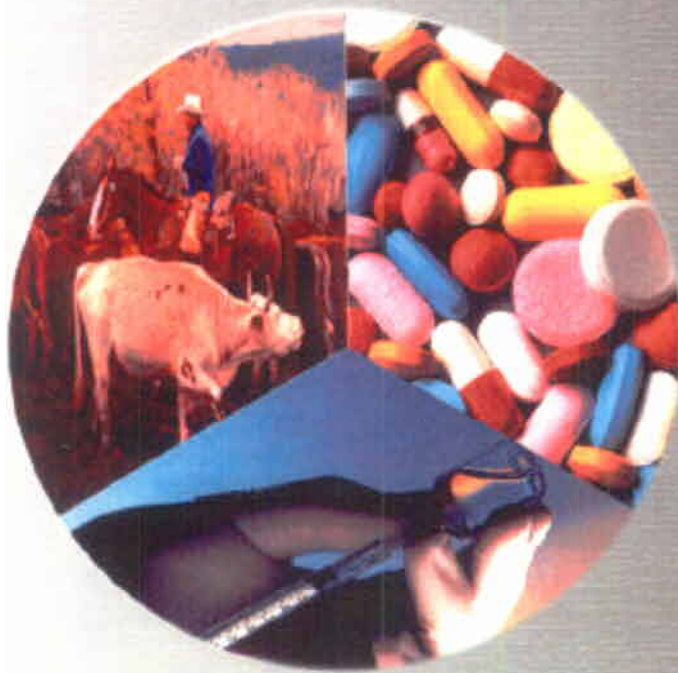
Corporate ties and contributions to local and state governments have played a huge role in strengthening states' hands. In the animal industries, integrated packers, producers and retailers regularly contribute to state and local governments. Federal health officials have lived with the fear that, in a disease emergency, it could be difficult to track and control animal movements due to pressure from a state's governor or Congressional representatives.

So here we stand, operating in a business world in which corporate interests are intertwined with enhanced state and local authority. Republicans and Democrats alike have successfully limited states' dependence on federal authority and money.

Whether each did so out of conviction or political expediency is arguable, but the results are in. A patchwork quilt of state policies and protocols -- over nutrition standards, food safety, risk tolerance, plant locations and animal movement -- is often tricky to navigate. States and their corporate constituents want greater say in international trade representation, similar to what they have in their home regions. Today's world holds no simple issues; seemingly every question has multiple unseen layers that somehow attract an eye-opening list of constituents in one region but not the next. Politics is, indeed, local.

Next week: What does this patchwork quilt mean for animal industries, health professionals, and state and federal collaborators?

Biotech



Alliance

Key Uncertainties



Two fundamental uncertainties set the stage for Biotech Alliance:

1. In the U.S., will public sector authority be centralized and flow principally from a strong federal government? Or, will authority be decentralized so that state and local governments are the primary drivers of public policy?
2. Will new and synergistic applications of genetic data enable life sciences alliances to succeed in creating new links among animal health organizations in public health, environmental health, and other sectors including medical technology, wildlife, drug discovery, financial services, and information technology? Or, will life sciences alliances fail to materialize, or at least fail to integrate animal health concerns?

IN 2009, decentralized government authority--coupled with innovative new partnerships between states and technical industries--has fueled a life science revolution. The entrepreneurial spirit has been unleashed in this era of deregulation, amidst a culture of collaboration among university researchers, agribusiness, laboratories, pharmaceutical and biological conglomerates, and state and local governments. Today farmers, doctors, pharmaceutical and biological companies, chemical processors, computer and communications companies and even energy companies have converged to make life-sciences one of the world's most dynamic industries.

At the celebration of its 10th anniversary, the California Institute for Science and Innovation awarded Craig Venter a Lifetime Achievement Award for his contributions to the life-science industry. Venter, the genome mapping pioneer, was among the first to recognize the need to merge the worlds of science with the worlds of commerce. Back in 1998, as one of the leading scientists on the U.S. Government's stalled \$2 billion biology project to map the human genome, he joined with the Perkin-Elmer Corporation to start a new company, Celera Genomics. When the government's project was at the halfway point in 1997, 90 percent of the money had been spent, but only 2.68 percent of the genome had been accurately sequenced. At Celera, Venter completed the mapping in two years without public funding.



Upon accepting the award, Venter reviewed the path of the life-science revolution, explaining that it was a combination of industrial collaboration and convergence plus a move toward a decentralized government that made it all possible:

"Thank you for this award. I am grateful for the opportunities I have had over the years to help unlock the secrets from life's basic building blocks. And really, this is your award too. We worked together to achieve the advances in life-sciences we see today.

"I congratulate you on this, your 10th anniversary. Back in December 2000, California Governor Gray Davis said he hoped to replicate the Silicon Valley model in creating three major research institutions dedicated to biotechnology, nanotechnology and telecommunications and computing. Well you did it.

"The private/public partnership you formed was unheard of at the time, but it soon became a model duplicated throughout the country. Realizing the competitive advantage this gave California, other states soon started forming their own partnerships.

"In Colorado, CEOs from high tech firms Hewlett Packard and IBM joined with agriculture giant ConAgra Foods and the biotech company Genzyme Transgenics to create a partnership focused on developing products to increase the efficiency of animal production while also broadening the uses of animals in medicine and industry. Regional partnerships in New England linked Ivy League schools and drug companies like BASF and Bristol-Myers

Squibb dedicated to producing proteins for cancer treatment.

"The initial funding of \$300 million in state funds--and \$600 million from corporate sponsors--seems minuscule when looking at your proposed budget of \$4 billion for 2010. But at the time, it represented an ambitious effort for a state. Historically, this type of project had been underwritten by the federal government, or it went nowhere.

"The role of the federal government in the area of life-sciences has changed dramatically over the past decade. While the public still expects government to protect our environment and public health, less emphasis has been placed on research and regulation.

"In the 1990's, when I worked on the human genome mapping project as a government scientist, everyone expected the federal government to take the lead in research. They supplied the money and the expertise. However,

Celera's successful merger of science and commerce showed that in some areas, such as research and regulation, a decentralized government focused on supporting innovation serves us better.

"Two other examples help illustrate this change. The first occurred early in the life-science revolution when a consumer backlash against GM products began to gain momentum. Although pressured to help reassure the public on the safety of GM products, the federal government made a decision not to regulate and label these products. This, in turn, forced the industry to accept responsibility for engaging the public in dialogue. Today, successful life-science companies routinely share information on genetic research and its benefits with the public.

"Another more recent example occurred when you, the California Institutes for Science and Innovation, endeavored to develop more rapid, accurate, and mobile PCR-based diagnostic devices for use in humans and animals. Portable, quantitative, rapid diagnostics -- coupled with the emerging array of DNA-based vaccines -- are revolutionizing human and animal medicine and changing some time-honored but obsolete approaches.

"The entrepreneurial spirit has been unleashed in this era of deregulation, but the real key that sparked the life-science revolution occurred when we created a culture of collaboration. University researchers needed to band together with agribusiness labs and pharmaceutical and biological conglomerates in order to understand what happens, at the molecular level, within individual cells. State and local governments began to team up with small entrepreneurial groups--people with a passion, a tolerance for risk and a commitment to problem solving.

"The birth of the life-science industry occurred when the boundaries between animal health and nonagricultural institutions in human health care, nutrition, environmental sciences, consumer products and information technology began to

converge. At the start of the 21st Century, the first biotech products were genetically modified crops marketed with promises to reduce costs and labor while increasing yield and nutritional value. These were followed by a small trickle of tantalizing breakthroughs. Leaves on genetically modified potato plants that glowed when dehydrated; the cloning of a disease-resistant black angus bull from genetic material frozen 15 years earlier; and bioengineered food used to carry vaccines against hepatitis B.

"Today farmers, doctors, pharmaceutical and biological companies, chemical processors, computer and communications companies and even energy companies have converged to make life-sciences the world's most dynamic industry. It is not uncommon to have drug companies working with cancer specialists and animal producers to turn animals into drug-manufacturing facilities."

"We are only into the first decade of a new era of scientific research and development, but what an exciting future lies ahead! In the near future consumers will buy genetically modified foods that will do more than increase the body's cancer defenses.

"These new products will poison cancer cells. Cloning technology that reverses the aging process will be used to develop innovative treatments for ailments. Cloned cells will give AIDS patients a young immune system and former athletes young cartilage in their knees. Using DNA chips, we will screen humans and animals to determine genetic disease predisposition and reaction to specific drug therapies. Someday soon our cars and homes will be powered from renewable plant and animal resources, and radioactivity-resistant bacteria will be used to clean up toxic waste sites. Indeed, the future will be an interesting place in which to live longer.

"Once again, congratulations on your 10th anniversary. I look forward to continuing our collaborative efforts."

Credits

Judy Akkina
Victoria Bridges
Tom Bunn
John Clifford
David Cummings
Linda Detwiler
Jere Dick
Terry Disney
Michael Doerrer
Ken Geter
Teresa Gilbert
Barbara Gillum
Chester Gipson
Donald Herriot
Steve Karli
Chris Kopral
Louise Lothery
Andrea Morgan
Ronald Morgan
Dale Rendahl
Byron Rippke
William Smith
Brian Trout
Carol Tuszynski
Rob Werge

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